

The Research Environment in the Chilean Business Schools

El entorno de investigación en las Escuelas de Negocios chilenas

Mbo'ehaovusu Ñemureko Chile-yguápe Tapereka ñemboguata

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Abstract

The business schools develop their activities in a competitive environment. In this context, it is crucial to analyze if the business schools are effective and efficient in their scientific production. This situation occurs in Chile, since the Chilean university market is one of the most intensive in the world in private participation. Considering the previous, the present study's objective is to describe the research environment in the Chilean business schools and to analyze if the way in which these structure (manage) their research teams has any impact on research indexes. In the 15 ranking of MBA of America Economía (2011) the 42 best Business Schools of Latin America are considered. Of the 42 Business Schools considered in the 2011 ranking, a total of 11 are from Chile. With this data the present research is divided in three parts. The factorial analysis of principal components can point out that the strategic decisions of business schools regarding the research can be grouped into 3 areas: 1) academic production; 2) research team; and 3) diffusion academic. According to the dimensions that determine the environment of research in the Chilean market, the business schools can be grouped into 4 categories. Besides, this study demonstrate that the investment made by business schools in terms of recruitment of teachers is generating results in levels of academic production; that the business schools can be divided into 2 groups in terms of their research levels and in 3 groups in relation with the research productivity; and that the way in which the business schools manage the research teams has impact in the research indexes.

Keywords: Business Schools, Research, Management, Scientific Production, Chile.

Resumen

Las escuelas de negocios desarrollan sus actividades en un entorno competitivo. En este contexto, es importante analizar si las escuelas de negocios son efectivas y eficientes en su producción científica. Esta situación ocurre en Chile, debido a que el mercado universitario chileno es uno de los más intensivos en el mundo en participación privada. Considerando lo anterior, el objetivo del presente estudio es describir el entorno de investigación de las escuelas de negocios y analizar si la forma en la cual estructuran (gestionan) sus equipos de investigación, tiene algún impacto sobre sus indicadores de investigación. En el ranking 15 de MBA de América Economía (2011) fueron consideradas las 42 mejores escuelas de negocios de Latinoamérica. De las 42 escuelas de negocios consideradas en el ranking 2011, un total de 11 son de Chile. Con esta data la presente investigación se divide en tres partes. El análisis factorial de componentes principales muestra que las decisiones estratégicas de investigación de las escuelas de negocios se agrupan en tres áreas: 1) producción académica; 2) equipo de investigación; y 3) difusión académica. De acuerdo con las dimensiones que determinan el entorno de investigación en el mercado chileno, las escuelas de negocios se agrupan en 4 categorías. Además, este estudio demuestra que la inversión hecha por las escuelas de negocios en términos de contratar profesores genera resultados en los niveles de producción académica; que las escuelas de negocios se dividen en dos grupos respecto a los niveles de inversión y en tres grupos en cuanto a la productividad de investigación; y que la forma en la cual las escuelas de negocios gestionan sus equipos de investigación tiene impacto en los índices de investigación.

Palabras Clave: Escuelas de Negocios, Investigación, Gestión, Producción Científica, Chile.

Mombykypyre

Umi mbo'ehaovusu, escuela de negocio oñehenóiva niko omba'apo ñoa'ãkatuípe. Umichahápe tekotevẽ ojehecha umi mbo'ehaovusúpa ha'ëve oguerojera haña arandu pyahu. Ko mba'e ojehu Chile-pe, upepegua mbo'ehaovusukuérape imbarete rehe umi ndaha'éiva Estado mba'e. Ojehechávo ko'ã mba'e niko ko tembiapópe oñemoha'ãngahaíta mba'éichapa uguatahína umi mbo'ehaovusu ñemureko rehegua ha oñehesa'ýjóta ha'ekuéra oñemohendaháicha omarandumono'õ hañuápa omombareteve térãpa omboguejyve tembikuaareka. Upe América Economía MBA ranking 15 (2011) ojejapyhýkuri umi 42 mbo'ehaovusu ñemoreko rehegua Latinoamérica-ygua.

Umi 42 ojejapyhyva'ekue 2011 oñeha'ã hağua, 11 kuri Chile-ygua. Ko'ã marandu ári, ko jehapykuereka oñemboja'o mbohapy hendápe. Oñehesa'ýj jóvo opa mba'e ojejuhuva'ekue, ojehechauka opa mba'e ojejapova'ekue ojehaperekakuévo arandu umi mbo'ehaovusu ñemureko reheguápe oñembyatyha mbohapy área-pe: 1) ñehekombo'e rehegua; 2) tembikuaareka ekípo; ha 3) tembiapokue ñemoherakuã. Ojererekóramo tesa renondépe mba'e mba'épa ombohekohína tembikuaareka Chile ñemurekópe, umi mbo'ehaovusu oñembyaty 4 categoría-pe. Ko jeporekápe avei ojejuhu inversión ojejapova'ekue oñemomba'apo hağua mbo'ehára oporombo'e rekávo tuichaiterei oipytyvõ hague oñembo'eporãvévo; upéicha avei ojejuhu ko'ã mbo'ehaovusu oñemohendaháicha omarandumono'õvo opokoha hembikuaarekäre.

Mba'e mba'e rehepa oñeñe'ẽ: Mbo'ehaovusu ñemureko rehegua, tapereka, Marandu arandu jerojera, Chile.

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Introduction

The business schools develop their activities to achieve two different objectives (Araya-Castillo & Escobar-Farfán, 2015). The first objective is achieved with the professors teach in pregraduate and postgraduate programs. But, the business schools invest their resources to create knowledge in the research projects.

Even when the research in the business schools has been criticized (the critical claim that the research in the business schools is not related with the practice of the profession), the research levels continue playing a significant role in the academic positioning of the business schools (Araya-Castillo et al., 2016).

Thus, in this scenario is crucial to analyze if the business schools are effective and efficient in their scientific production. The scientific productivity has important consequences in the decision of allocating resources, because it is achieved with the recruitment of researchers who spend a considerable part of their diary job to the generation of knowledge. Besides, the results in the research indexes have a direct effect in the position occupied by the business schools in the prestige rankings.

Considering this context, the literature in business should propose methodologies to measure the productivity of the business schools in the generation of knowledge. This phenomenon has been observed with studies comparing the levels of the research in the economic and business disciplines with the basic sciences (or with the social sciences). However, it hasn't analyzed the impact of the research team's structures in the levels of research.

This situation is crucial in the Latin American schools, due to these show lower levels in the research in comparison with the developed countries (and the levels of research in business are low compared with the results in the basic sciences).

Thus, in the present study we describe the research environment in the business schools, because it is important to know the competitive dynamic in this market. Once analyzed the research environment, we propose a methodology which can be used to measure the impact of the structural form of the research teams in the levels of research.

Literature Review

The Research in the Business Schools

O'Brien et al. (2011) claim that the Merriam-Webster (2008) dictionary defines a university as an institution of higher learning providing facilities for teaching and research. In this sense, the nature of academic research is understood how that of knowledge creation (Adams et al., 2008).

The same is shared by the business schools, because the most of these claim a dual mission: to educate practitioners and to create knowledge through research (Warren et al., 2005). However, even when some scholars argue that the scientific model in the business schools has been predicated on the faulty assumption that business is an academic discipline like chemistry or geology, we can find some significant differences between them.

The business is a profession, akin to medicine and the law, and business schools are professional schools-or should be (Warren & O'Toole, 2005). Thus, the management (and the education in management) is erected with the assumption that there is a positive and significant relationship between knowledge and practice (Sauquet et al., 2006).

However, the scholarly research conducted by business school faculty has long been the subject of intense criticism for lacking relevance and value to practice (Warren & O'Toole, 2005; O'Brien et al., 2011). Burke and James (2010) argue that many prominent scholars suggesting that research has overemphasized rigor and theory (Hambrick, 2007) at the expense of relevance and value to practice (Bartunek, 2007; Hambrick, 2007; McGrath, 2007; Pfeffer, 2007; Tsui, 2007).

Thus, considering the context of the actual situation in the business schools research, we could assume that graduate business education is deeply troubled (O'Brien et al., 2011), because the research productivity continues playing a primary role in appraisals of faculty performance (Shepherd et al., 2009) and accredited business schools (Stanton et al., 2009).

In this scenario, the business schools must find the solution to a perennial dilemma, which implies to answer how they can motivate faculty to pursue research that has scholarly significance and in the same time can be applied in the real world (Walker, 2010). This is relevant, because recent research has also provided empirical support for the positive relationship between academic research and business school reputations (Rindova et al., 2005), and rankings (Drnevich et al., 2011; Araya-Castillo & Escobar-Farfán, 2015).

Although the relevance of the research in the business schools is recognized in the literature, few studies have analyzed the scientific productivity in the economic and business disciplines (Contreras et al., 2006). The most of these studies analyze the research activity in the basic sciences and are not focused in the Latin American context.

Business Research in Latin American

Contreras et al. (2006) claim that are few the studies focusing in the understanding of the levels of research in developing countries (and even less the studies focus in the economic and business field).

One of the few studies was realized by Koljatic and Silva (2001). In this study the authors analyze the scientific production between the years 1995 and 1998 and conclude that the countries with the highest levels of research in Latin America are Brazil, Argentina, Chile and Mexico.

Business Research: What for? Olavarrieta (2011) argues that the Latin American business schools research with the aim of satisfying the objectives of three different groups. These groups are the society, institutions and academics.

The society provide to the people of public goods. In this scenario the research realized by the business schools improves the global knowledge. Besides, the research projects improve the business practices and managers effectiveness.

The second group is composed by the institutions (business schools). For this group, the research projects help in the processes of teaching and learning, because the researchers/professors do research on teaching and learning of Biz matters. Besides, the researchers/professors teach what they do research and the levels of research are useful in the rankings and Accreditation (AQ).

Finally, the third group corresponds to the academics. The academics research because it permits that they can achieve prestige among academics (in the academic environment). Besides, the academics research because they can increase their salaries with the different incentives applied by the business schools. Another explicative reason argues that the academics get pleasure when they research.

Levels of Research. Olavarrieta (2011) analyzed the Web of Science (ISI) publications (between 1984 and May 2009) by researchers affiliated to Latin American institutions. This analysis considered the following outputs:

Authorships, Weighted Authorships, Total Pages, Weighted Pages, Total Citations and Weighted Citations.

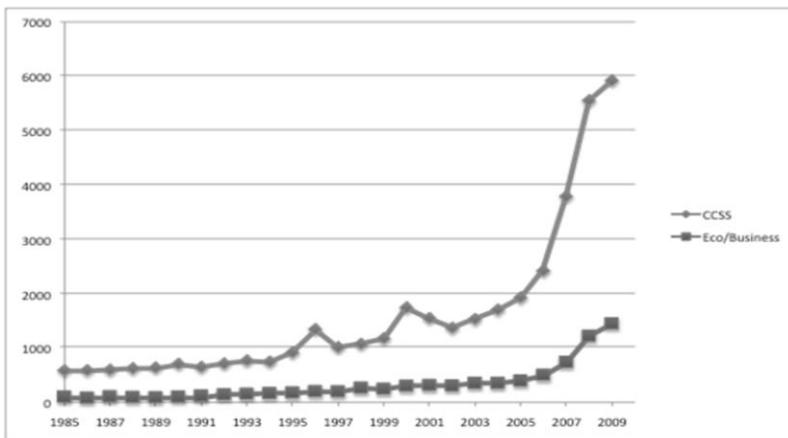
The author searched by country, including all records in the following five categories: Business, Business and Finance, Management, Operational Research and Management Science, and Economics.

In this analysis, Olavarrieta (2011) found 6700 papers wrote by Latin American affiliated authors, 3755 weighted authorships and that the researchers sometimes participate in research projects with researchers from other countries (the first two positions are occupied by US and UK/Spain).

One similar study was realized by Contreras et al. (2006). These authors compared the scientific productivity (papers ISI) published between the years 1984 and 2003. The results of this study show that the economic and business disciplines publish a smaller number of papers in comparison with other disciplines, such as medicine and chemistry. However, the economic and business disciplines have the lowest costs for papers, wherewith these have the best indices in productivity.

Another important issue analyzed in Contreras et al. (2006) is related with the weight of the economic and business research in the total number of publications. According to Contreras et al. (2006), only a 0.8% of the total papers correspond to the economic and business disciplines. In this line of analysis, Olavarrieta (2011) conclude that the economic and business disciplines don't have a predominant role in the social sciences.

Graph 1. *Research in the Economic and Business disciplines (1984 – may 2009)*



Source: By Olavarrieta, 2011.

Besides, Olavarrieta (2011) argue that levels of research in Latin American are growing, but it still is lowed. In this line of analysis, Olavarrieta (2008) argue that research in Latin America has experienced an important progress, but challenges remain to foster more relevant research for business practice.

Thus, we can argue that Latin American business schools must face the challenge of finding new and creative ways to foster research as well as to increase productivity in this field.

However, not all countries show high levels in research. In fact, the Latin American research is concentrated in five countries, which have the 90% of research (and 9 countries concentrate the 98% of the research).

In the Table 1 we can observe that in this group of five countries, Brazil and Chile occupy the first two positions. In fact, from the 19 countries analyzed by Olavarrieta (2011), only Brazil and Chile have published over 1000 papers in this period of years.

Table 1. *Publications by Country*

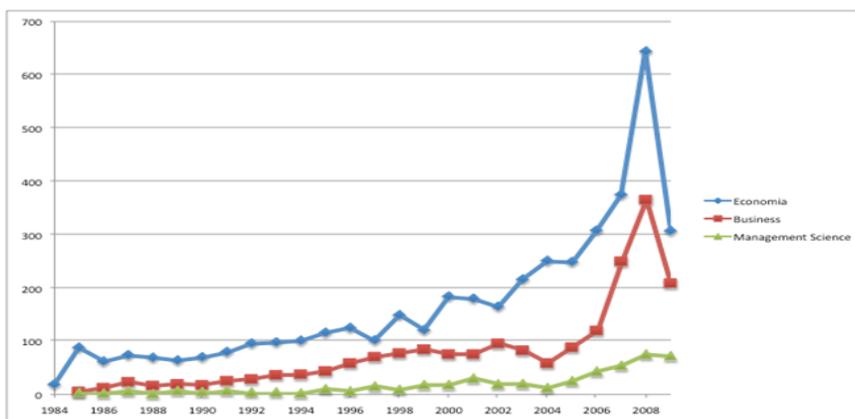
Country	Total Authorships	Weighted Authorships	Total Pages	Weighted Pages	Total Citations	Weighted Citations
BRASIL	1758	913	25188	14401	6588	3733
CHILE	1063	524	18616	10059	3782	2026
MEXICO	941	576	17910	11261	3762	2353
ARGENTINA	910	530	15750	10649	2637	1847
COLOMBIA	243	143	3884	2454	682	425
VENEZUELA	218	120	3793	2106	48	27
COSTA RICA	70	36	793	465	300	214
PERU	68	39	1153	736	443	181
URUGUAY	63	36	1135	660	541	257
ECUADOR	33	15	480	248	77	27

BOLIVIA	13	7	159	119	8	3
GUATEMALA	10	6	139	110	25	13
CUBA	6	5	83	60	34	21
HONDURAS	5	3	86	52	9	9
PANAMA	5	2	44	16	3	1
EL SALVADOR	3	2	61	34	12	4
PUERTO RICO	3	2	67	34	0	0
PARAGUAY	2	2	26	26	0	0
TRINIDAD Y TOBAGO	1	0	21	7	0	0

Source: By Olavarrieta (2011)

Finally, we can observe a relevant analysis if divide the research realized by the business schools into three groups: Economic, Business and Management Science (Olavarrieta, 2011). From these disciplines, the first position in the number of publications is occupied by economic.

Graph 2. *Publications by Disciplines*



Source: By Olavarrieta, 2011.

Business Research Drivers. In the business schools the research is based on recruitment of professors with PhD studies. However, the experience suggests that it is necessary but not sufficient (Olavarrieta, 2011). According to Olavarrieta (2011), the business schools use other drivers:

- Individual Drivers: internal motives, development, skillful to do research (training and practice), time allocation and job assignment.
- Organizational Drivers: work load, team configuration, economic incentives, promotion and tenure climate (collaboration and research).

The individual drivers and organizational drivers affect the research output, which is measured in quantity and quality. However, in this process the individual and organizational drivers are not independent, because they interact by: a) Recruitment, Development and Time allocation; and b) Configuration, Incentives and Spirit.

Besides, in this process we observe the role of other industry players, because the research promotion is not just an organizational function and because this can also be promoted if the environment favors research productivity (Olavarrieta, 2011). Thus, a possible model must consider the inclusion of other two players, who affect the research output (quantity and quality) too: a) Suppliers, Complementors and Quality of Demand; and b) Environment and Competition.

The “suppliers, complementors and quality of demand” are characterized by the Ph.D. supply and programs, Latin American journal and conference quality and relevance. Besides, this player is characterized by the connection with industry, industry technical sophistication and demand for research.

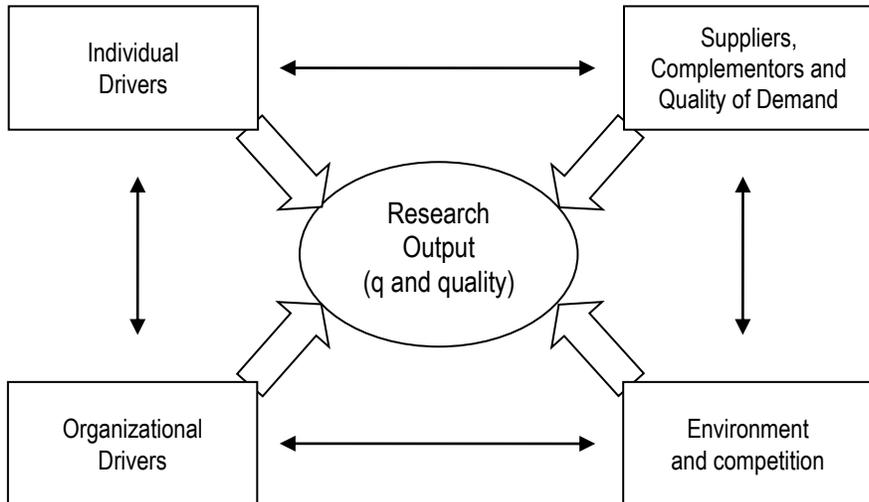
On the other hand, the “local market competitiveness (cluster)” is characterized by institutional, national and global funding. Other factors considered are the national and global accreditation bodies, rankings, global competition, collaboration and incentives, and substitutes of potential competitors.

These two additional players interact among them by the manage competition and the collaboration and global networking. But, these two additional players interact with the individual drivers and organizational drivers too.

This point is important, because the “suppliers, complementors and quality of demand” and “environment and competition” can interact in a direct

or indirect way with the “individual drivers” and “organizational drivers”. The result of this interaction process affects the research output.

Figure 1. *An Integrated Model of Research Industry Competitiveness*



SOURCE: By Olavarrieta, 2011.

Research in Chilean Business Schools

Business School. The Chilean university market is one of the most intensive in the world in private, or non-governmental, participation, second only to Korea (Brunner & Uribe, 2007; Pressacco & Carbone, 2010; Araya-Castillo & Bernardo, 2017). Chile has only 18 state universities out of a total of 61. Of all operative universities in Chile, 18 are state (public) universities, 9 are semi-private with state help and 34 are private.

Furthermore, Chile (along with Korea and Japan) are characterized by educational institutions that compete for students, resources and prestige, while governmental politics intervene at a distance with the end of regulating this market (Brunner & Uribe, 2007). This is reflected in the financing of superior education in Chile, given that currently, of the total expenditure on superior education (equivalent to 1.5% of PIB), 0.55% is financed by the State and the rest by the private sector (Thieme et al., 2012).

In this scenario, the Chilean university market is characterized by high levels of competition, which is even more apparent in the 49 existing business schools the 2011 (Araya-Castillo & Escobar-Farfán, 2015). Unlike other superior education markets where the most prestigious schools are public (such as

Medicine, Engineering, Law), in the Business Schools the market leaders are both private and public institutions.

These business schools compete in postgraduate and executive education, which are structured in 4 different ways¹. 1) Business and Economic Schools: Of public origin, these impart academic programs in business and economics, 2) Business Schools linked to universities: Of private origin, these are dependent on a university (of which they are a part) and offer academic programs only in the area of business; 3) Academic Departments: Of public or private origin, these are part of the Engineering Faculty in a university, since they are small in size and lack their own position; and 4) Business Schools not connected to universities: Of private origin they offer only postgraduate programs and are not dependent (or part of) any university.

In this competitive dynamic, two large groups of business schools can be observed which are distinguished by the strategies followed in relation to the selection of market objectives and localization of resources. This explains that the competitive strategies of Chilean Business Schools respond to the typology proposed by Porter (Porter, 1979).

We can further distinguish the highly selective business schools (public and private) in the selection of students, since these admit students with the best scores on the University Selection Test (PSU). These business schools contract professors with a postgraduate academic formation (especially doctorate studies) to invest in research projects, and in turn attract executives with a successful work trajectory with the end of becoming a professor and linking the private world to the university.

Furthermore, the business schools in this group are characterized by having higher funding for their academic programs, of offering attractive salaries to their professors and of seeking international accreditations. This allows the business schools to compete successfully with postgraduate programs (in some cases offering dual qualifications with American or European Universities) and attract students that are executives that occupy high positions and/or foreign students.

Moreover, a second group of business schools is oriented towards enticing students. This type of university offers pregraduate programs in different study modalities, such as day, evening, weekend, semi-present and online schedules. They typically do not offer postgraduate programs, in that this

¹ With the objective of facilitating the understanding, in this research is used the name of "Business School", even when these can be structured in 4 different ways.

segment seeks to undertake studies in the recognized Business Schools at a national level.

Additionally, in some cases these business schools have campuses in more than one geographic region, in that they seek to increase market participation levels. Consequently, they do not invest in professors with postgraduate degrees or in projects of research.

The success of these strategies followed by the different business schools is measured each year by the position held in various rankings of pregraduate programs (Que Pasa and America Economía) and postgraduate programs (America Economía).

The position that the universities occupy in these rankings allows them to have high levels of selectivity in admitting students, charge higher tuitions for their academic programs and offer postgraduate programs in other Latin American countries. That is, the research can be considered as an investment in the business schools with the aim of creating an image of excellence in the Chilean market.

Level of Research. The Chilean Business Schools occupy a very good position in research. According to Olavarrieta (2011) among the top 10 Latin American business schools we can find two Chilean institutions, which occupy the first positions.

Table 2. *Top 10 Latin American Business Schools in Research*

INSTITUTION	Total Authorships	Weighted Authorships	Total Pages	Weighted Pages	Total Citations	Weighted Citations
UNIVERSIDAD DE CHILE	352	170,0	4615	3264,1	939	672,5
PUC CHILE	290	150,3	3944	2893,2	840	529,8
USP	226	117,3	2409	1740,8	410	308,2
FUNDACAO GETULIO VARGAS	215	18,9	2995	1983,4	756	518,1
UNIVERSIDADE FEDERAL DO RIO DE JANEIRO	196	103,1	1993	1529,8	878	635,5

INSTITUTO TECNOLOGICO AUTONOMO DE MEXICO	151	91,5	2672	1842,4	825	570,8
UNIVERSIDAD DE BUENOS AIRES	149	101,9	2516	1975,5	410	356,3
UNIVERSIDAD TORCUATO DI TELLA	135	67,3	2340	1401,0	549	295,0
PUC RIO	129	73,6	1975	1389,0	231	150,3
UNAM	115	73,1	1737	1451,2	245	182,9

Source: By Olavarrieta, 2011.

Furthermore, Olavarrieta (2011) analyze the levels of research in the different Chilean business schools. According to these results, we can argue that the first positions in the research ranking are occupied by best two business schools in the prestige rankings (University of Chile and Pontificia Universidad Católica).

This result is interesting, because we can argue that the Chilean market in the business school is dominated by public (state) and private institutions. In fact, the business school of the University of Chile is a public university.

This phenomenon is reflecting the high levels of competition in the Chilean market, which explain that the fees in the best public business schools are not very different from the fees in the private business schools (in Chile the fees in the public universities are not controlled by the government).

Table 3. *The Research in the Chilean Business Schools*

Institution	Authorships			Weighted Authorships			Weighted Pages		
	Econ	Biz	Total	Econ	Biz	Total	Econ	Biz	Total
U. Chile	224	175	399	107,3	64,5	171,8	2217,9	1117,2	3335,1
PUC P. Univ. Católica Chile	128	171	299	80,3	74,6	154,8	1833,9	1168,2	3002,2
Banco central de Chile	52	8	60	23,7	3,5	27,2	478,2	89,2	567,3
ECLAC – CEPAL	25	9	34	17,6	5,3	23,0	339,0	93,2	432,2
Univ. Adolfo Ibanez	15	33	48	7,5	14,6	22,1	184,3	192,7	377,0
CIEPLAN	15	1	16	11,0	1,0	12,0	226,0	18,0	244,0
Univ. Concepcion	14	5	19	7,8	1,9	9,7	208,5	24,3	232,8

Univ. Desarrollo	10	3	13	6,3	1,3	7,7	105,2	21,3	126,5
Univ. Austral Chile	10	5	15	4,8	2,1	6,8	54,4	27,3	81,7
PUCV P. Univ. Católica Valparaíso	8	8	16	3,2	3,0	6,2	36,2	47,0	83,2
Univ. Talca	7	4	11	3,2	2,5	5,7	30,5	38,5	69,0
Univ. Diego Portales	7	5	12	2,9	2,3	5,3	75,4	28,8	104,3
Univ. Los Andes	4	8	12	1,7	3,0	4,7	42,2	89,0	131,2
Univ. Valparaiso	5	1	6	3,5	0,3	3,8	43,0	7,3	50,3
UAH	4	2	6	1,7	1,5	3,2	42,3	27,5	69,8
Univ. Tecn Santa Maria	2	2	4	1,5	1,0	2,5	28,5	7,0	35,5
Univ. Bio	4	3	7	1,3	1,2	2,5	11,7	14,3	26,0
RIMISP	9	0	9	2,4	0,0	2,4	33,5	0,0	33,5
Univ. Santiago	0	2	2	0,0	1,3	1,3	0,0	15,0	15,0
Univ. Católica Norte	1	2	3	0,3	0,8	1,2	5,3	23,3	28,7
Univ. Tarapaca	0	3	3	0,0	1,0	1,0	0,0	10,0	10,0
Ctr Estudios Publ	3	0	3	1,0	0,0	1,0	21,0	0,0	21,0
Minist Planif. & Cooper.	2	0	2	0,6	0,0	0,6	11,8	0,0	11,8
Univ. Frontera	0	0	0	0,0	0,0	0,0	0,0	0,0	0,0
Total (sólo instit. Chilenas)	549	450	999	289	187	476	6029	3059	9088

Source: By Olavarrieta, 2011.

Methodology

The present study's objective is to describe the research environment in the Chilean business schools and to analyze if the way in which these structure (manage) their research teams has any impact on research indexes.

The Empirical Study

Research Design. The present research is of a descriptive kind (Malhotra, 2004), in that it will analyze the data collected by America Economía with the objective of studying the main characteristics in the research environment and the relationship between the way research teams at business schools are structured and their levels of productivity.

Sampling Frame. In Chile 49 business schools exist (of private and public origin), which are distinguished by the market segment at which they are directed and by the academic programs offered. Nevertheless, in the present

research only those universities where it is possible to obtain data will be considered, and those that have the highest competitively indicators.

Sampling Selection. In the 15 ranking of MBA of America Economía (2011) the 42 best Business Schools of Latin America are considered. To make this proposal, America Economía Intelligence used an indicator that was composed of five different dimensions; 1) Academic Strength, 2) Production and Diffusion of Knowledge; 3) Internationalization; 4) Network Power; and 5) In Business Environment.

Of the 42 Business Schools considered in the 2011 ranking, a total of 11 are from Chile. Thus, these Business Schools were selected as a sampling in the present investigation. The prior was corroborated by information from the rankings of the best Business Schools that offer pregraduate programs in Chile (Que Pasa and America Economía), making the MBA ranking the most complete about the data of this research proposal.

Description of the Sample. Given the objective of the present research, research data (inputs) and results (outputs) of the research indexes of business schools in Chile were taken into consideration. The former assumes that the investment made by business schools in relation to contracting academics (full time and part time) with doctorate studies is reflected in the scientific productivity indexes (ISI papers, papers in other bases, cases and books).

Together with the above, a revision of public information of each of the selected 11 business schools was done, with the objective of collecting information about the way their research teams were structured (departments, research centers, etc.) and about the edition of academic magazines.

Therefore, we can appreciate that in Table 4 Chilean business schools organize their research teams in terms of departments or research centers; an exemption being the Business School of Alberto Hurtado University, since the research is organized by a general director. Additionally, in Table 4 you can see the decisions made by business schools regarding how many professors with doctorate degrees they have in their faculty.

Table 4. *Structural Indicators of Research Teams and Researchers in Business Schools*

Universidad	Type ²	Academic Departments	Centers of Research	Full Time Professors	Full Time Professors with PhD Studies	Part Time Professors	Part Time Professors with PhD Studies
Universidad de Chile	PU	3	11	95	87	46	26
Pontificia Universidad Católica	PA	2	8	39	22	27	6
Universidad Adolfo Ibáñez	PR	0	9	39	39	23	8
Universidad del Desarrollo	PR	0	3	30	24	54	12
Universidad Técnica Federico Santa María	PA	0	2	29	27	26	11
Universidad Diego Portales	PR	0	4	42	21	26	7
Universidad Alberto Hurtado	PR	1	0	21	13	13	4
Universidad de Talca	PU	0	4	29	22	10	0
Universidad de Santiago	PU	4	2	46	18	27	8
Universidad Gabriela Mistral	PR	0	1	11	6	23	5
IEDE	PR	1	0	14	11	95	17

SOURCE: Prepared from information obtained from *América Economía* (2011) and other public information.

Finally, in Table 5 we can see the productivity indicators of the departments and/or research centers of business schools. Productivity can be

² This classification refers to the origin of the business schools. Thus; 1) PU= Public, 2) PA = Private with state help; 3) PR = Private.

measured by public papers in indexed magazines (ISI, SCIELO, etc.), cases and books (or chapters in books).

Table 5. *Scientific Productivity Indicators in Business Schools*

University	Papers ISI	Papers ISI / Full Time Professors	Papers in otherdatabases	Papers in other databases / Full Time Professors	Cases	Cases / Full Time Professors	Books	Books / Full Time Professors
Universidad de Chile	202	2,13	57	0,60	17	0,18	23	0,24
Pontificia Universidad Católica	52	1,33	12	0,31	36	0,92	5	0,13
Universidad Adolfo Ibáñez	88	2,26	52	1,33	57	1,46	23	0,59
Universidad del Desarrollo	33	1,10	22	0,73	28	0,93	22	0,73
Universidad Técnica Federico Santa María	23	0,79	7	0,24	4	0,14	14	0,48
Universidad Diego Portales	39	0,93	45	1,07	31	0,74	18	0,43
Universidad Alberto Hurtado	26	1,24	26	4,10	18	0,86	14	0,67
Universidad de Talca	22	0,76	47	1,62	25	0,86	5	0,17
Universidad de Santiago	9	0,20	6	0,13	7	0,15	12	0,26
Universidad Gabriela Mistral	0	0	0	0	0	0	2	0,18
IEDE	0	0	1	0,07	8	0,57	8	0,57

Source: Prepared from information obtained from America Economía (2011) and other public information.

Analytical Method

The present research is divided in three parts. In the first the research environment is described through four different statistical analyses. The first analysis consists of an exploratory factorial analysis with the methodology of principal component analysis to determine the dimensions (strategic variables) that define the competitive dynamic of Chilean business schools³ (Hair et al., 1999). Once the strategic dimensions are obtained, the business schools will be grouped according to their scores in the strategic dimensions of a K-Means cluster analysis (Chan, 2004). The third analysis will consist of an analysis of the performance related to the allocation of resources of the business schools with the obtained results in the research indicators (Johnes & Johnes, 1995); in this analysis the Pearson correlation is used to detect the relationship between the inputs and outputs variables (Chan, 2003). The last analysis in the first part will be reflected in position maps to analyze the strategic position of the business schools (Malhotra, 2004).

The second part of this study has as objective to analyze if the way in which the business schools manage their research teams has impact in the levels of research. Thus, with this objective the analysis will be reflected in the statistical analysis of comparison mean (Malhotra, 2004). In this part, the study looks for differences in the levels of research in concordance with the different ways in which the research teams can be organized (Cronan & Al-Rafee, 2007).

Results**Determination of Strategic Variables**

The factorial analysis of principal components can point out that the strategic decisions of business schools regarding the research can be grouped into 3 areas: 1) Academic Production; 2) Research Team; and 3) Diffusion Academic.

³ There are two types of Factor Analysis, the Common Factor Analysis and the Component Analysis (Hair et al., 2005). Other authors define these types of Factor Analysis as Principal Component Analysis and Factor Analysis (or Exploratory Factor Analysis).

Table 6. *Strategic Dimensions of Business Schools*

Indicators	Component 1 "Academic Production"	Component 2 "Research Team"	Component 3 "Diffusion Academic"
Cases	0.924		
Papers ISI / Full Time Professors	0.829		
Papers in other databases	0.681		
Books	0.640		
Part Time Professors with PhD		0.961	
Full Time Professor with PhD		0.839	
Academic Journals D			0.971

SOURCE: By the author.

Academic production is related to the results of research projects involving academics. Thus, this dimension (factor) can be interpreted as the productivity of the research team. Additionally, research decisions can be related to the decision to connect with the academic community through editing journals.

Finally, it is possible to support that the Analysis of Principal Components held is appropriate, in that the value of KMO = 0.610 fulfills the condition of being greater than 0.5 (Malhotra, 2004); furthermore, it meets with that the probability associated with the Test of Bartlett (p -value) is less than the significant level, or $0.000 < 0.05$ (Hair et al., 2005).

Determination of the Clusters

It is possible to note that, according to the dimensions that determine the environment of research in the Chilean market, the business schools can be grouped into 4 categories. These groups are homogenous in their interior, but heterogeneous with the rest of the groups.

Table 7. Groups of Business Schools in Chile

Cluster	Business Schools	Academic Production	Team Research	Academic Edition
Group 1	Universidad Adolfo Ibáñez, Universidad de Desarrollo and Universidad Diego Portales	1,10935	0,04729	-0,89392
Group 2	Pontificia Universidad Católica, Universidad Alberto Hurtado and Universidad de Talca	0,23867	-0,87445	1,05223
Group 3	Universidad de Chile	0,07436	2,54944	1,31995
Group 4	Universidad Técnica Federico Santa María, Universidad de Santiago, Universidad Gabriela Mistral and IEDE.	-1,02961	-0,01699	-0,44873

SOURCE: By the author

Group 1 is comprised of the business school of the University of Adolfo Ibanez, the University of Desarrollo and the University of Diego Portales. This group presents high levels of academic production but low levels of academic diffusion. For example, none of these business schools have academic diffusion in magazines.

Group 2 is comprised of the Business school of Pontificia Universidad Católica, the University of Alberto Hurtado and the University of Talca. This group presents above average values of production and academic diffusion, but low values in research teams. For example, the business schools in this section typically do not have an abundant faculty and/or lack professor with doctorate degrees.

Moreover, Group 3 is comprised only of the University of Chile and presents elevated levels in research teams and academic diffusion, but low levels of academic production. For example, the University of Chile is ranked number 1 in research teams but number 2 in academic production.

Finally, Group 4 is comprised of the business schools of the Technical University of Federico Santa Maria, the University of Santiago, the University of Gabriela Mistral and IEDE. This group presents the lowest values of each of areas of research, which is coherent with the position they occupy in the rankings (they occupy the lowest positions).

Thus, we can argue that in the environment research of the Chilean business schools we can find four different groups. These groups are differentiated in relation with the weights of their members (business schools) in the determinants of the research environment. These groups have established different decisions in the research strategies.

Academic Performance

The results shown in Table 8 indicate the reality of the research level of the business schools in Chile, in that positive and significant correlations are observed between the input variable (academics with doctoral studies) and the outcome variables (papers and books).

Thus, Table 8 presents indicators that demonstrate that the investment made by business schools in terms of recruitment of teachers with doctorates is generating results in levels of academic production. This approach is seen in many business schools, which assign higher levels of teaching loads to their professors and at the same time offer bonuses that encourage the publication of ISI papers.

In this scenario positive and significant correlations can be seen between the endowment of professors (full time, full time with doctorate studies and part time with doctorate studies) and the number of ISI papers. Perhaps this is a response to the incentive policy of various business schools consistent with the payment of production bonuses to academics for the number of ISI publications, since no significant correlations with published papers can be seen in other databases.

In the case of full time professors with doctorate degrees significant and positive correlations are also seen with book publications (or chapters in books). The former can be explained by the nature of these professors (what distinguished them from part-time professors), since they dedicate all their time to academics and publish books as part of their professional development.

Finally, there is not a significant correlation between levels of professors with doctorate degrees and academic magazines from their own business school. This is explained by the fact that most of these magazines are not indexed and/or if they are it's not looked upon positively to accept a large portion of academic papers from their own business schools.

Table 8. *Performance of Business Schools in Chile*

		Papers ISI	Papers in other databa- ses	Cases	Books	Acade- mic Jour- nals
Full Time Professors	Correlation of Pearson	,904**	,326	,196	,569	,469
	Sig. (bilateral)	,000	,328	,563	,068	,146
	N	11	11	11	11	11
Full Time Professors with PhD	Correlation of Pearson	,972**	,380	,228	,624*	,334
	Sig. (bilateral)	,000	,249	,500	,040	,316
	N	11	11	11	11	11
Part Time Professors	Correlation of Pearson	,022	-,402	-,212	,106	-,339
	Sig. (bilateral)	,950	,221	,532	,757	,307
	N	11	11	11	11	11
Part Time Professors with PhD	Correlation of Pearson	,659*	-,066	-,176	,507	-,012
	Sig. (bilateral)	,028	,848	,604	,112	,972
	N	11	11	11	11	11

**The correlation is significant at a level of 0.01 (bilateral).

* The correlation is significant at a level of 0.05 (bilateral).

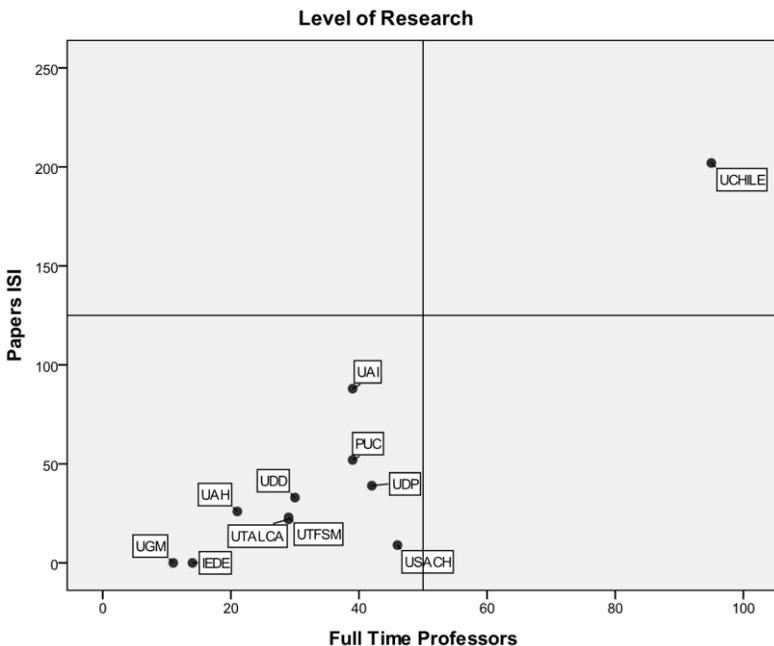
Research Position in Business Schools

In Graph 3 scientific production of business schools is analyzed. Note that only full-time professors are considered since in the previous analysis the number of part time professors has no correlation with ISI publications.

Thus, one can appreciate that Chilean business schools can be divided into 2 large groups in terms of their research levels. One of these groups is comprised of the business school of the University of Chile, which presents the highest number of ISI publications at a national level, and which possesses the largest faculty.

Meanwhile, the second group is comprised of the remaining business schools. The composition of the business schools that make up this group is heterogeneous, since they are organized in terms of their investment levels and research productivity. For example, the business schools of the University of Gabriela Mistral and IEDE have the lowest levels of scientific production, and the University of Adolfo Ibanez and Pontificia Universidad Católica have the highest levels.

Graph 3. Research in Business Schools in Chile



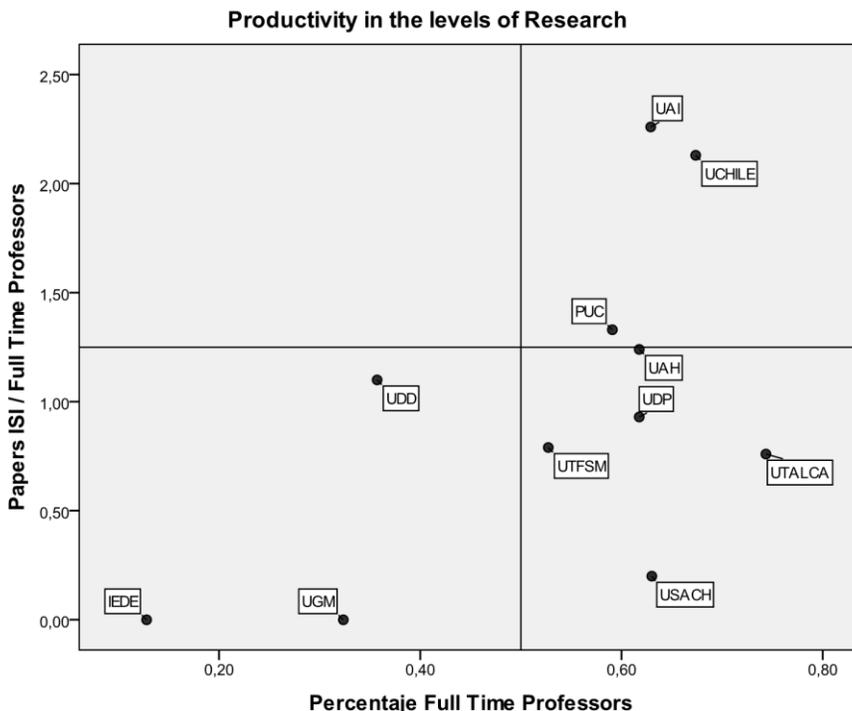
Finally, in Graph 4 the analysis is different because it analyzes the position of business schools in terms of their levels of productivity in scientific production. Likewise, only full-time professors (of total professors) were considered because these represent the greatest investment on part of the business schools and they are who relate directly to the research levels.

We can differentiate between 3 groups which differ in terms of the correlation observed between levels of full-time professors and levels of publication per professor. In this scenario, the first position in productivity is occupied by the business school of the University of Adolfo Ibanez, the University of Chile and Pontificia Universidad Católica, all of which present the highest percentage of full-time professors. These results are coherent with the diverse rankings that exist at a national level (pregraduate and postgraduate), where these three business schools always occupy the highest positions (even when the position varied depending on the rankings and year of study).

In second place we find the group made up of the business school of the University of Desarrollo, the University of Gabriela Mistral and IEDE. In this group the highest levels of productivity are observed in the business school of the University of Desarrollo, as increases are like those of other business schools belonging to Group 3 and have the highest percentage of full time teachers in their faculty.

Finally, in Group 3 we find the highest concentration of business schools (University of Alberto Hurtado, University of Diego Portales, University of Talca, Technical University of Federico Santa Maria and University of Santiago). Of this group, the business school of the University of Santiago stands out because it has the lowest levels of productivity, even like those of other business schools in this group that have a lower percentage of fulltime professors in their staff.

Graph 4. Research Productivity of Business Schools in Chile



Differences in the Research Levels of Different Business Schools

The following analysis' objective is to evaluate if the way in which business schools structure their research teams has any impact on the levels of productivity. This study tries to contribute with the literature, because there are not studies where the authors analyze this issue.

Thus, we analyze pairs of combinations according to the distinct ways they are structured in the various business schools in Chile: 1) Departments and Research Centers; 2) Only Research Centers; 3) Only Departments; and 4) No Structure (the research is coordinated by a general director).

Table 9. *Research Levels by Structure Type*

Type of Structure	Sample Size	Papers ISI	Papers in other databases	Cases	Books
Departments and Research Centers	3	87,67	25	20	13,33
Others Structural Forms:	8	28,88	32,50	21,38	13,25
a) Only Research Centers	6	34,17	28,83	24,17	14
b) Only Departments	1	0	1	8	8
c) No Structure (the research is coordinated by a general director)	1	26	86	14	18

SOURCE: By the author.

Even when, the sample size could be criticized by the scholars, the purpose with this analyze is to get a first approximation to a crucial variable in the competitive behavior of the Chilean business schools.

Thus, future research could check the hypothesis formulated in this study, which is “the way in which the business schools manage the research teams has impact in the research indexes”. Unfortunately, it isn’t possible increase the reliability of this study in the actual context of Chile, because there aren’t information of all the business schools.

Therefore, considering the limitation of the sample size, in the analysis of the comparison of means, only two structural groups are considered: 1) Departments and Centers of Research; and 2) Other Structural Forms, which correspond to the possibility that the business schools are structured as Research Centers, Departments or by research being coordinated via general direction.

Even when this study has the limitation in the sample size, the analysis of comparison of means permits to note that there are significant differences in the means of scientific production of ISI papers. In the other options the level of significance is greater than 0.05 and hence, we cannot reject the null hypothesis that the means are equal.

The previous can be explained in function of the importance that Chilean Business Schools attribute to scientific production in ISI Magazines, which is reflected in the types of contracts that are established with professors (where their work time is divided into teaching and ISI publishing), bonuses for

ISI papers published over the assigned amount, and the greater weight assigned to this type of scientific production (in comparison to papers published in SCIELO magazines or case studies).

Table 10. *Analysis of Comparison of Means by Structure Type*

Compared Pairs		Papers ISI	Papers in other databases	Cases	Books
Departments and Research Centers – Other Structural Forms	Significance Levels	0,042	0,718	0,903	0,988

Source: By the author

Finally, we can argue that these results are promissory, because according to the statistical principles we could wait higher levels of fit in the data with bigger sample size. In fact, in the scenario of analyze the population's data (that is, the information of the 49 business schools) we could get significant differences in the other academic production indicators (papers in other databases, cases and books).

Conclusions and Implications

In this study we have contributed with the literature in business, because it is proposed the need for studying and measuring the productivity of the business schools in the generation of knowledge.

The literature has focused the analysis of the research impact in the comparison with the levels of research in other disciplines. This type of analysis is good to understand the role of the business schools in the academic world, but it is insufficient when the objective is to analyze if the business schools are effective and efficient in the scientific production.

Thus, we propose to measure the impact in the research of the business schools in relation with the investment in strategic resources. According to this point of view, the business schools can invest in their two different functions: teach and research.

The investment in teaching has a direct effect in the results of the business schools, because it can be measure with the levels of satisfaction or in the retention rates of the students. However, the impact of the research in the results of the business schools is more difficult of measuring.

The effect of the research in the results of the business schools is indirect. The position of the business schools in the rankings influence the decision of the future students and the fee what could be established by the business schools.

This phenomenon isn't only observed in the developed countries, but also in the developing countries. In the Latin American business schools, we observe an increase in the levels of competition in the business education market. This situation explains that the Latin American business schools are recruiting a greater number of professors with PhD studies.

So, in this scenario is crucial to evaluate the decisions made by the business schools. The analysis of the competitive dynamic in the Chilean business schools permits to hypothesize that the levels in research are influenced by the way in which are organized the research teams.

Considering this aim, we have analyzed the best 11 Chilean business schools. Even when some scholars can consider that the results in this study are biased (by the sample size) and only have exploratory importance, we argue that the impact of the structural forms in the publication in papers ISI is significant.

However, we haven't proposed a model, and we hope that future research can apply this methodology in markets with more information.

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